

# A Simple Approximate Analysis of Floating Content for Context-Aware Applications

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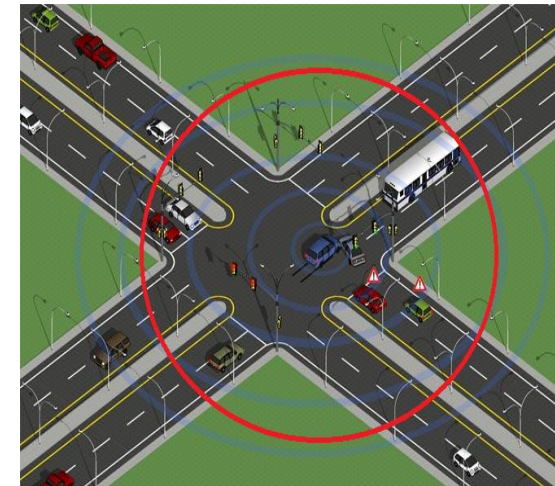
**HES–SO Valais**, Sierre, Switzerland

# The Floating Content service

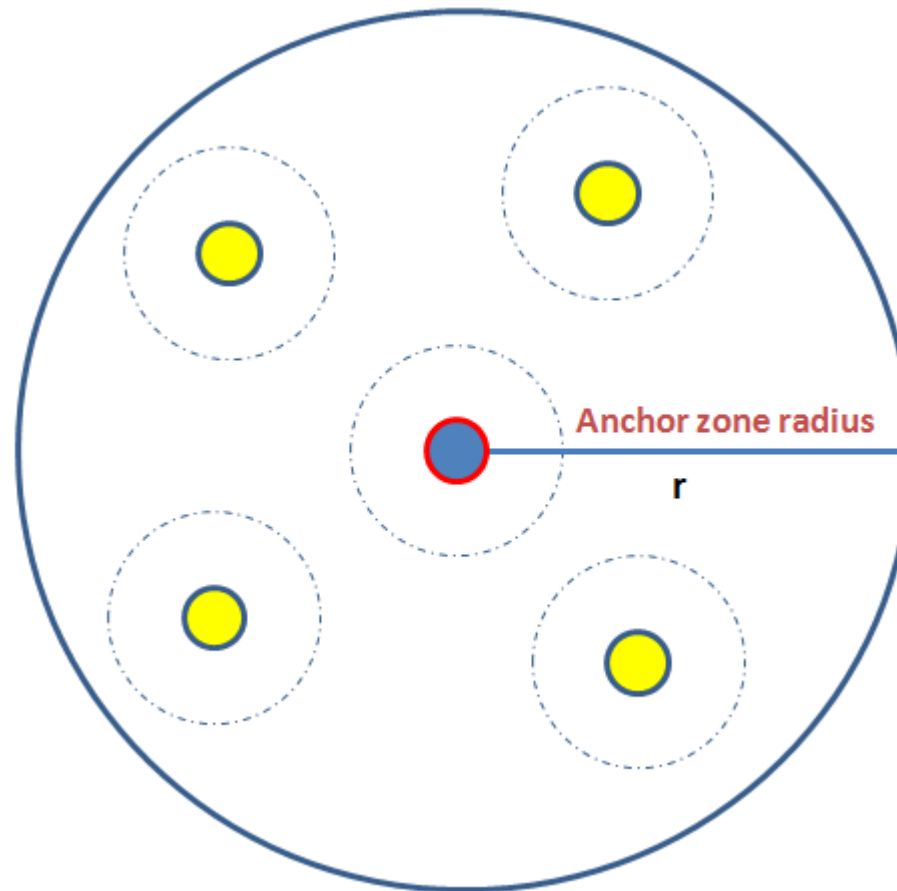
Objective: ensuring the availability of some data to mobile users

- within a certain geographic area
- for a given duration in time
- without infrastructure support

Applications: Emergency services,  
road traffic information,  
social networks...

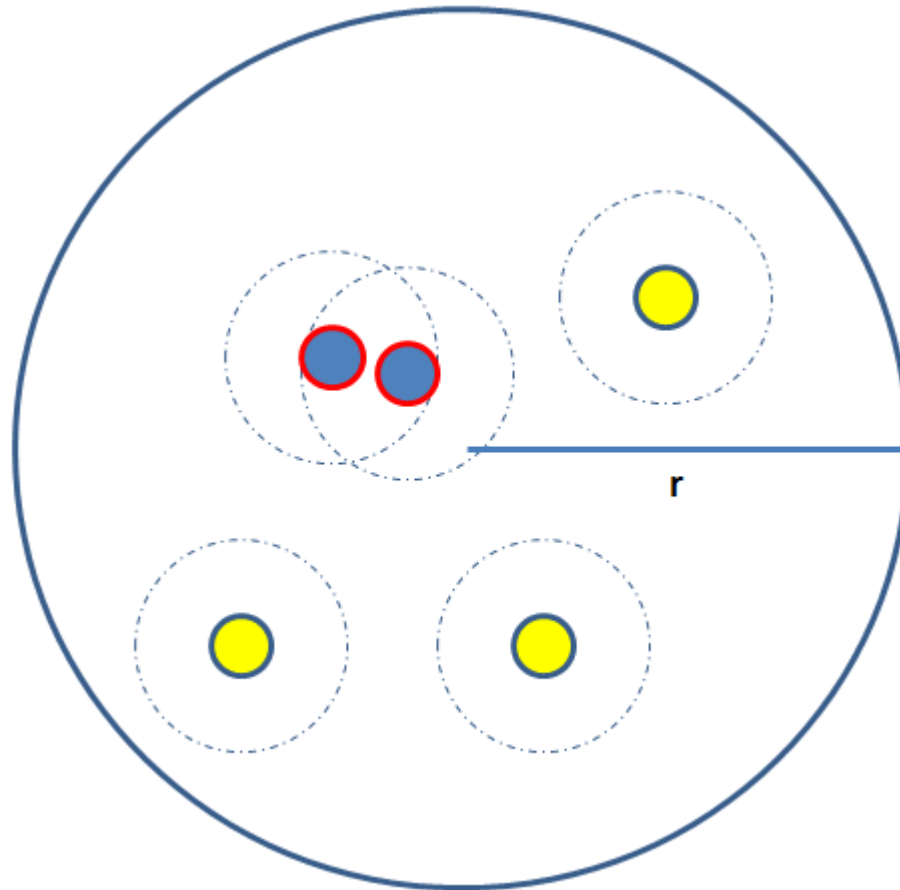


# The basic FC mechanism

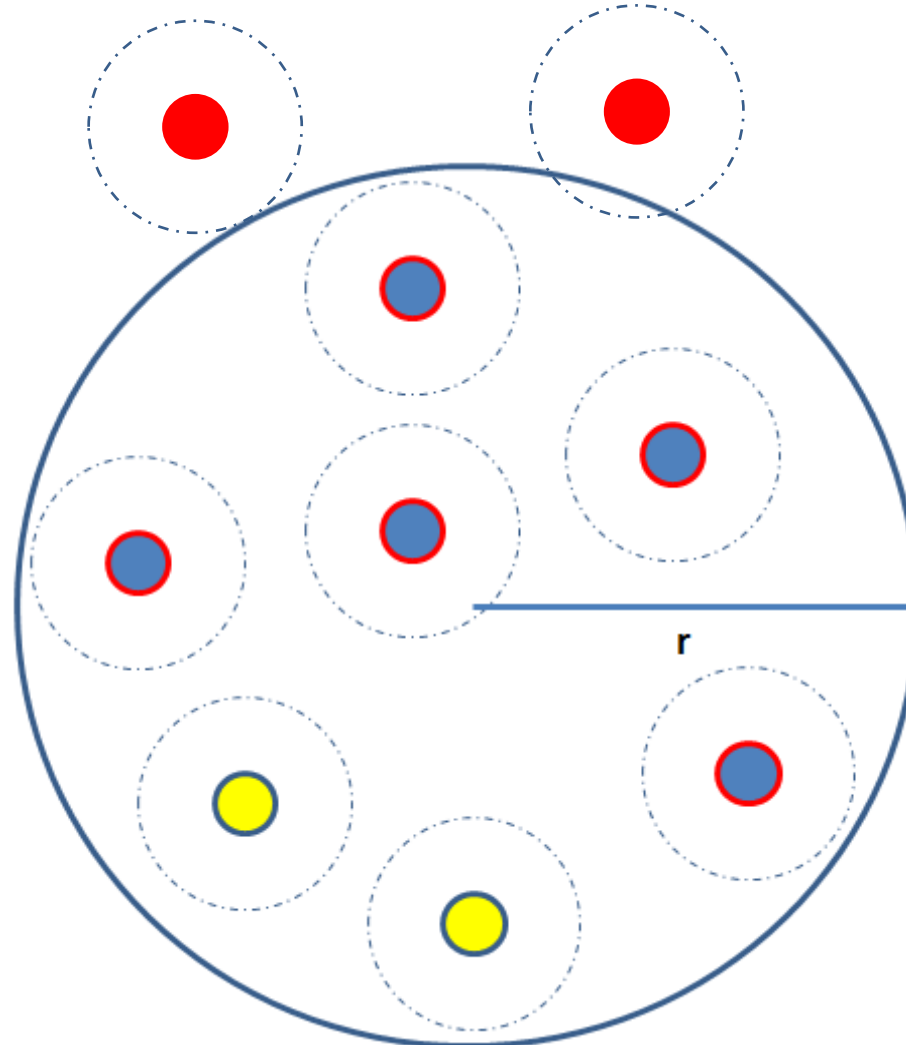


**I - A node generates content**

# The basic FC mechanism



# The basic FC mechanism



    III - Content “floats” within the Anchor Zone

# We considered the performance of FC from an application perspective

What is the performance of applications using FC?

- What applications can be supported with acceptable performance?
- How to engineer the application to achieve a given QoS?

State of the art:

- Analysis: sufficient conditions for the content to float

# Our results

- We developed an simple analytical model for performance analysis of applications relying on FC
  - Our model is accurate on a variety of configurations
  - Simulations: our result are accurate even outside of the model
- FC is a viable communication service for a large class of context aware applications

# We built a simple model for application performance

- Random direction mobility model
- Users distributed according to a Poisson PP

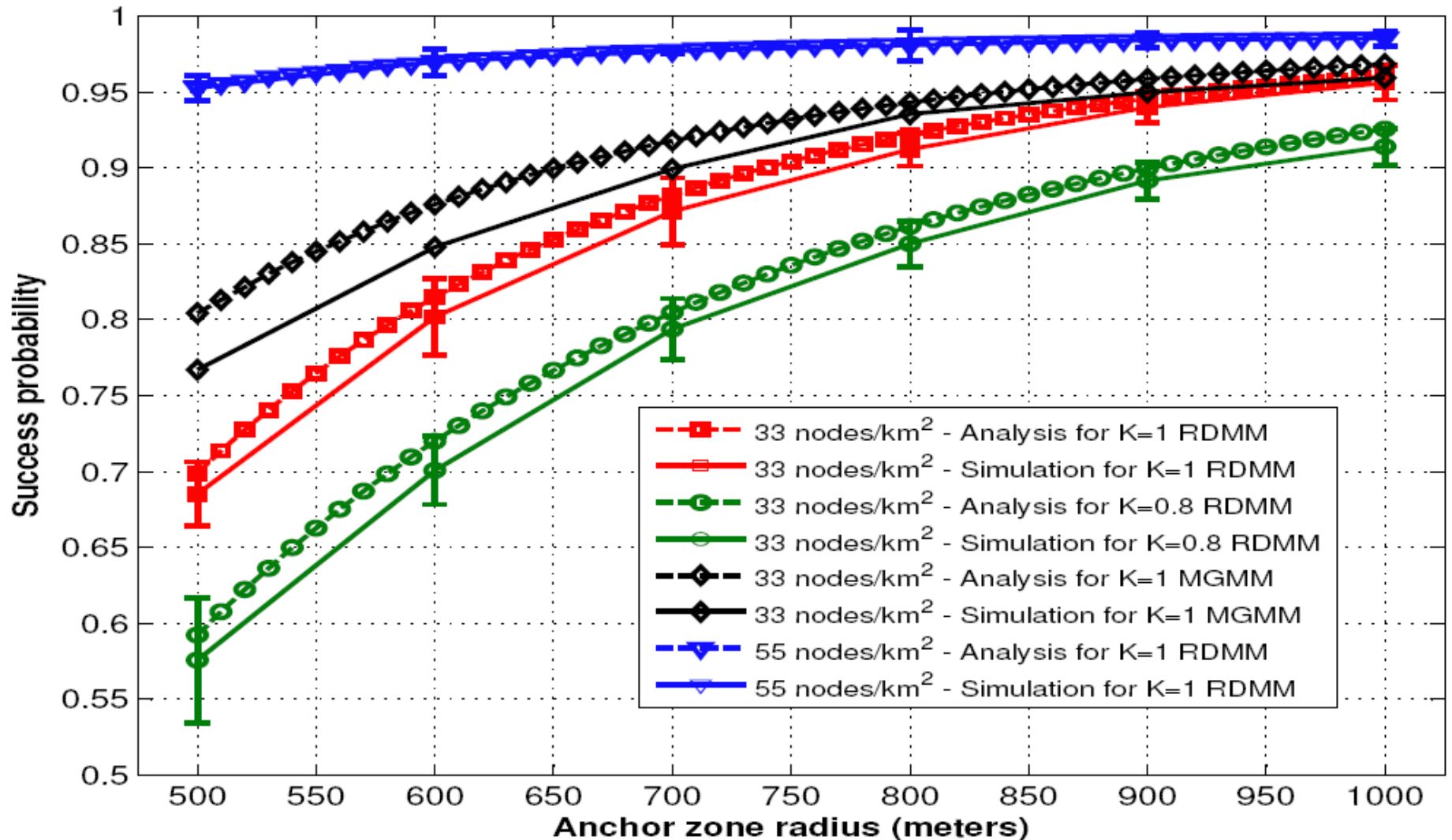
$P(s) = P(\text{a user gets the content before leaving the AZ})$

$$P_S = \sum_{k=1}^{\infty} \int_{l_{min}}^{l_{max}} \left( f_L(l) \frac{(2rl\lambda)^k e^{-2rl\lambda}}{k!} \right) dl \left[ 1 - \left( 1 - \frac{Q\bar{n}}{(\bar{m} + \bar{n})} \right)^k \right]$$

P( having K contacts)
P(at least 1 successful contact over K)



# The formula is accurate, even outside the model



# Future work

- Extension to more realistic mobility models
- Evaluation on real mobility traces